

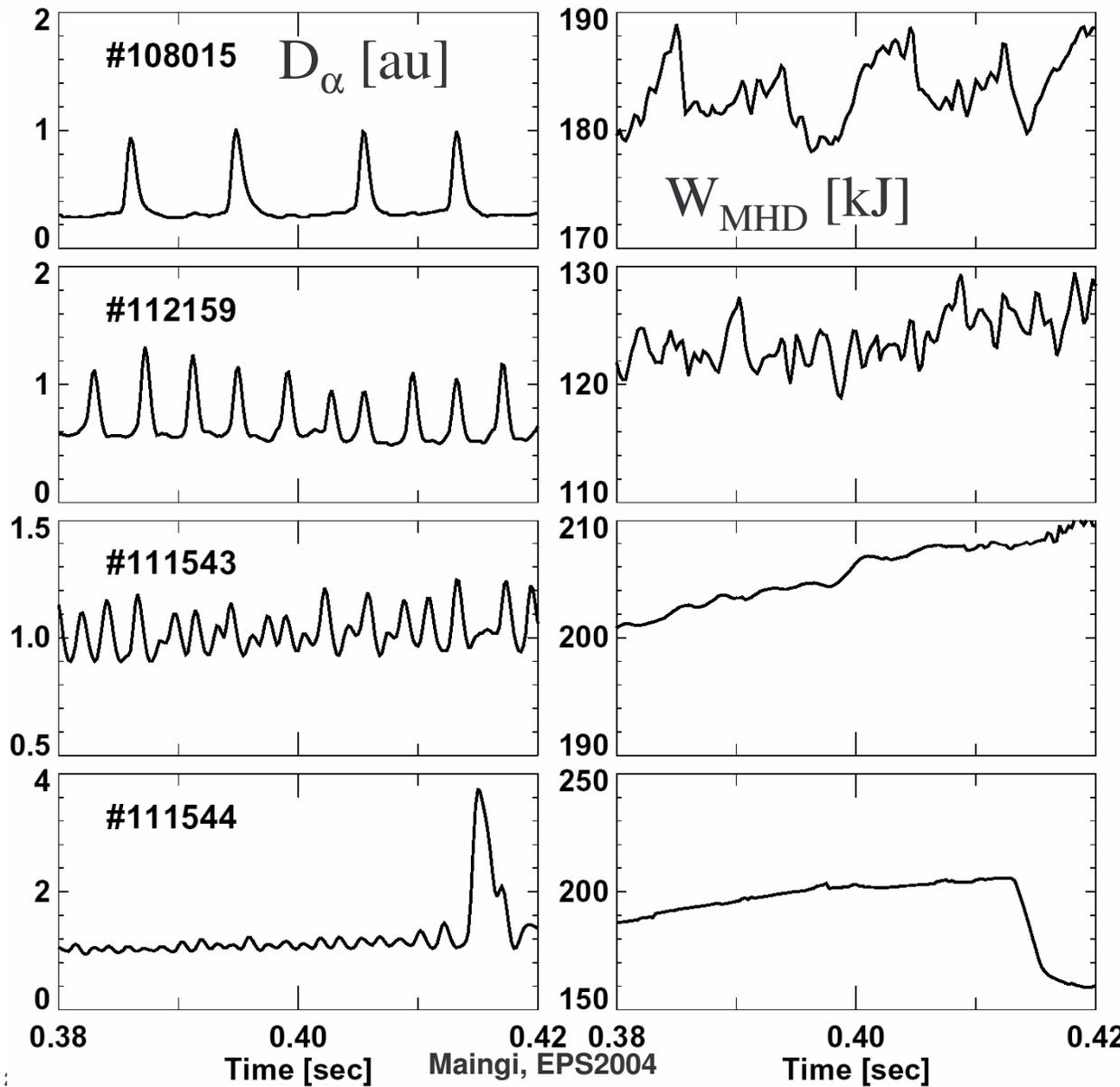
ORNL ALPS Program Continues NSTX tasks with New Goal of Assessing small ELM Extrapolability to ITER



- NSTX Staged Lithium Program support (40k - Maingi)
 - Continued analysis of Lithium pellet experiments
 - *Lithium evaporator experiments participation*
 - Transient particle and power loading: edge-localized modes (ELMs) and disruptions
 - *Extrapolability of small ELM regimes to ITER*
 - Module A and Module B tasks, e.g. heat flux calculations and extrapolations
- DiMES background plasma modeling (10k - Owen/Maingi)
- Steering Committee Service (10k - Maingi)



Wide variety of ELM Regimes observed in NSTX



Type I - Large

$$\Delta W_{\text{MHD}}/W_{\text{MHD}}: 3-15\%$$

Type III - Medium

$$\Delta W_{\text{MHD}}/W_{\text{MHD}}: 1-5\%$$

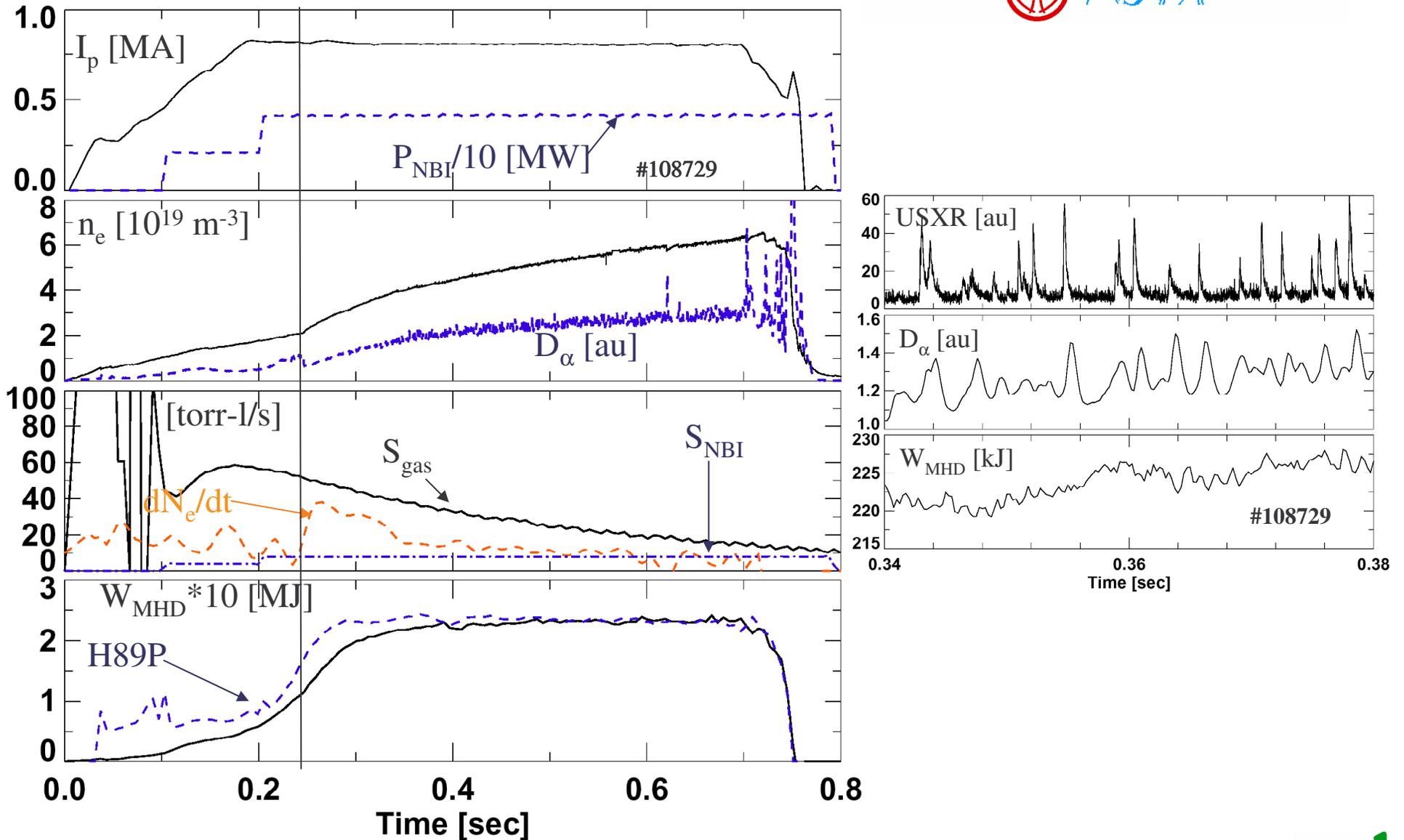
NEW, Type V - Small

$$\Delta W_{\text{MHD}}/W_{\text{MHD}} < 1\%$$

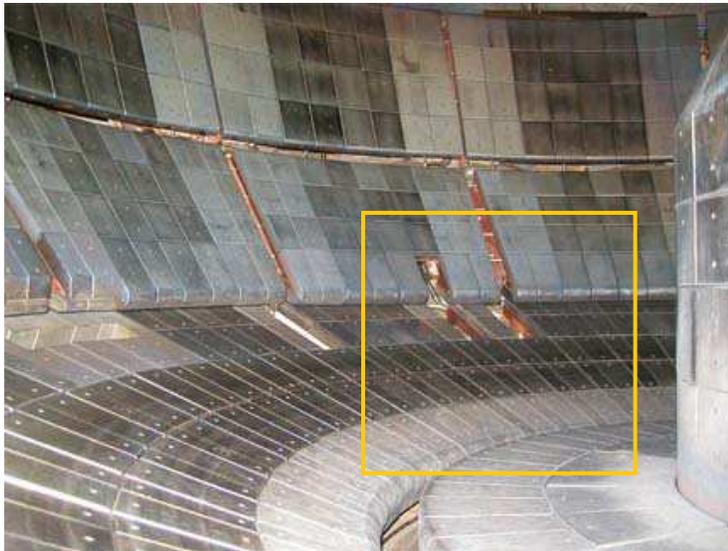
**Mixed Type V +
'Giant ELM'**

$$\Delta W_{\text{MHD}}/W_{\text{MHD}} < 30\%$$

Small ELMs in high performance discharge (Type V)



Small ELMs modulate divertor MARFE location



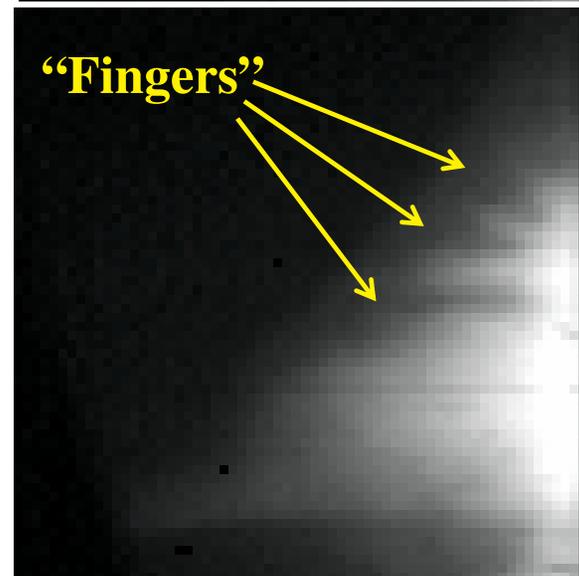
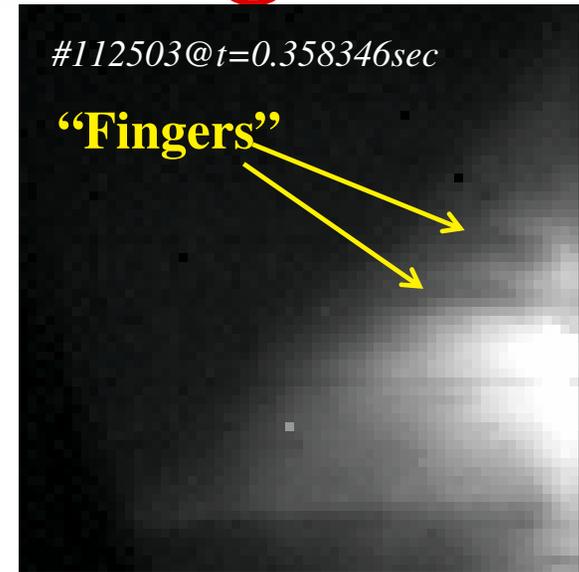
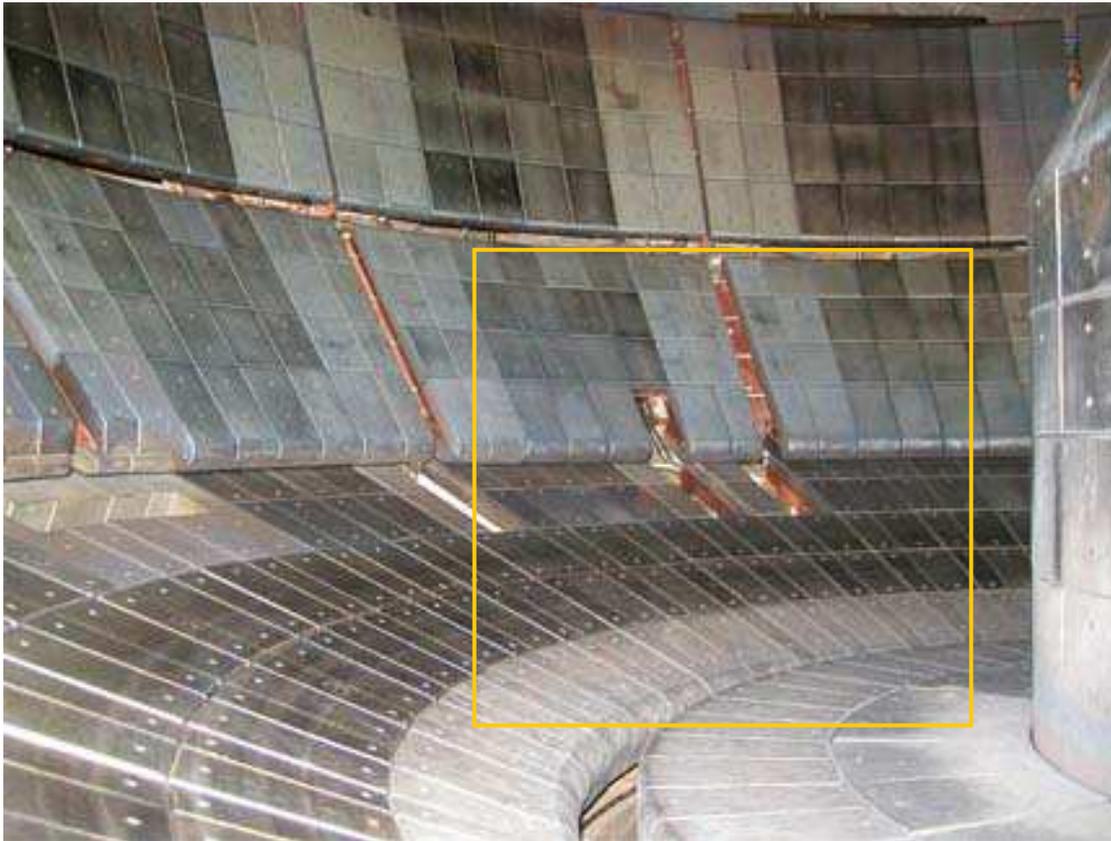
Inner
Separatrix

MARFE-
like region

QuickTime™ and a
decompressor
are needed to see this picture.

- Large ELM burns thru
- MARFE provides light

Large (up to 15 cm) finger-like bands observed during Type V ELMs



Fingers could be related to:

- X-point instabilities
- Homoclinic tangles

